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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/514,454	02/25/00	REIBER	PA1118

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IM62/1025

EXAMINER

EDMONDSON, L

ART UNIT	PAPER NUMBER
1725	7

DATE MAILED: 10/25/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

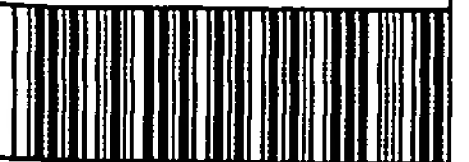
Office Action Summary

Application No.
09/514,454

Applicant(s)
Reiber et al.

Examiner
Lynne Edmondson

Group Art Unit
1725



☒ Responsive to communication(s) filed on Feb 25, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-18 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-7 and 10-18 is/are rejected.

☒ Claim(s) 8 and 9 is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 6

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

1. Claims 1, 3 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Elwood et al. (USPN 5217154).

Elwood teaches a bonding tool formed of a stiff and abrasive material such as tungsten carbide with diamond (col 2 lines 44-58 and col 3 lines 12-22) other known, typically used materials are titanium carbide and ceramics (col 1 lines 51-63). See Elwood claims 1-3.

2. Claims 1, 2, 10 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Matcovich et al. (USPN 4315128).

Matcovich teaches a bonding tool with a dense alumina tip (col 3 lines 46-61). Tool resistance is 10^2 to 10^6 ohm per square (col 5 lines 1-6).

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3. Claims 1 and 3 are rejected under 35 U.S.C. 102(e) as being anticipated by Hadar et al. (USPN 5931368).

Hadar teaches a bonding tool of hard, abrasive material with a diamond or ceramic coating among other materials (col 4 lines 14-25). Note that the core is tungsten carbide with a coating of titanium nitride (col 5 lines 38-45) and dopants may be introduced (col 6 lines 37-43).

4. Claims 1, 3, 10 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Razon et al. (USPN 6073827).

Razon teaches a bonding tool made of a hard, abrasive material such as alumina, ruby, or tungsten carbide (col 4 lines 16-47 and lines 65-67). See Razon claims 7, 9 and 12.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elwood et al. (USPN 5217154) in view of Omori et al. (USPN 4502983).

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Elwood teaches a bonding tool formed of a stiff and abrasive material such as tungsten carbide with diamond (col 2 lines 44-58 and col 3 lines 12-22) other known, typically used materials are metal carbides and ceramics (col 1 lines 51-63). See Elwood claims 1-3. Although metal carbides are disclosed, there is no disclosure of material resistance or of a silicon carbide material doped with boron. Neither is material resistance disclosed.

Omori teaches a silicon carbide material doped with boron (col 6 lines 48-60) to form a strong, stiff material used for a variety of tools and electronic applications. The material resistance is 10^{11} ohm-cm (col 11 lines 1-22). See Omori claim 4 where it is taught that this material exhibits semiconducting properties.

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ the semiconductor material (which would have a resistance in the range 10 to 10^{12}) to enhance wear and abrasion resistance, while decreasing stress at the tip. Thereby increasing productivity and bond quality (Elwood, col 1 lines 62-68).

6. Claims 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matcovich et al. (USPN 4315128) in view of Chatterjee et al. (USPN 5827470).

Matcovich teaches a bonding tool with a dense alumina tip (col 3 lines 46-61). Tool resistance is 10^2 to 10^6 ohm per square (col 5 lines 1-6). Although ceramics are taught, there is no disclosure of a combination of alumina and zirconia.

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Chatterjee teaches a hard alumina-zirconia material for tools with high wear and abrasion resistance (col 3 lines 30-47) having 5-50% alumina and therefore 50-95% zirconia (col 5 lines 43-50). See also col 6 lines 5-9.

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ dense zirconia and alumina as the tool material for reliability and extended life (Matcovich, col 2 lines 17-23).

7. Claims 2 and 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hadar et al. (USPN 5931368) in view of Omori et al. (USPN 4502983).

Hadar teaches a bonding tool of hard, abrasive material with a diamond or ceramic coating among other materials (col 4 lines 14-25). Note that the core is tungsten carbide with a coating of titanium nitride (col 5 lines 38-45) and dopants may be introduced (col 6 lines 37-43). Although silicon carbide is disclosed as a tool material (col 4 line 25 and col 5 line 39), there is no disclosure of a boron dopant. Neither is material resistance disclosed.

Omori teaches a silicon carbide material doped with boron (col 6 lines 48-60) to form a strong, stiff material used for a variety of tools and electronic applications. The material resistance is 10^{11} ohm-cm (col 11 lines 1-22). See Omori claim 4 where it is taught that this material exhibits semiconducting properties.

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the boron (BN, Hadar, col 4 line 25) as a nitrate in the doping chamber (Hadar, col 6

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lines 37-42) and supply this material as a coating around an insulating (amorphous alumina) core for enhanced wear bonding tools without post machining (Hadar, col 5 lines 32-35) while maintaining tolerances for fine pitch bonding and increasing tool life (Hadar, col 1 lines 45-53).

Allowable Subject Matter

8. Claims 8 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Since allowable subject matter has been indicated, applicant is encouraged to submit formal drawings in response to this Office action. The early submission of formal drawings will permit the Office to review the drawings for acceptability and to resolve any informalities remaining therein before the application is passed to issue. This will avoid possible delays in the issue process.

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Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Dworak et al. (USPN 4331048), Suzuki et al. (USPN 4897710), Test et al. (USPN 5544804), Haefling et al. (USPN 4691854), Kyocera (JPN 63164228), Mitsubishi (JPN 54037114), Plaisted et al. (USPN 4909427), Poli et al. (USPN 5280979) and Linn (USPN 5816472).

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne Edmondson whose telephone number is (703) 306-5699.



LRE

October 19, 2000